

REMARKS

The Office Action dated January 14, 2009 was received and carefully reviewed.

Prior to this reply, claims 1-56 were pending in the subject application. By this response, claims 1, 6, 8, and 13 have been amended to clarify the invention, and not for reasons of patentability. Claims 2, 9, and 15-56 are hereby canceled without prejudice or disclaimer. New claims 68-97 have been added herein, and do not contain new matter. Accordingly, claims 1, 3-8, 10-14 and 68-97 are currently pending in the subject application.

Support for the amendments to claims 1 and 8 can be found at least in page 14, lines 28-30 and page 15, lines 1-14, as well as FIG. 4C of the specification as originally filed. Support for the features in newly added claims 68-71 can be seen at least in Embodiment Mode 1 and FIGS. 4A-6D of the specification as originally filed. The features of claims 72, 78, 84, and 90 are supported at least in page 18, lines 27-30 and page 19, lines 1-8 and FIG. 4E of the specification as originally filed. Support for the features of claims 73, 79, 85, and 91 are supported at least by page 12, lines 19-21 and page 15, lines 14-16 of the specification as originally filed. The features recited in newly added claims 74, 80, 86, and 92 are supported at least by page 7, lines 15-23 and page 8, lines 4-7 of the specification as originally filed. Support for the features recited in newly added claims 75, 81, 87, and 93 can be seen at least at page 7, lines 2-3 of the specification as originally filed. The features of claims 76, 82, 88, and 94 are supported at least by page 39, lines 20-28 and FIG. 27 of the specification as originally filed. Support for the feature of claims 77, 83, 89, and 95-97 can be found at least in FIG. 4C of the specification as originally filed. Accordingly, Applicants respectfully assert that no new matter has been introduced by this response.

In view of the above amendments and the following remarks, Applicants respectfully request reconsideration and allowance of the subject application.

Claim Rejections - 35 U.S.C. § 103

Claims 1, 4-8, 11-15, 18-23, 25-29, 32-36, 39-43, 46-50, and 53-56 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Yamazaki et al. (U.S. Pub. No.: 2003/0040150 A1) (*Yamazaki*, hereinafter) in view of Kitazawa et al. (U.S. Patent No. 5,920,082) (*Kitazawa*, hereinafter). Claims 2, 3, 9, 10, 16, 17, 23, 24, 30, 31, 37, 38, 44, 45, 51, and 52 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over

Yamazaki in view of *Kitazawa*, and in further view of *Tsuzumitani* et al. (U.S. Patent No.: 6,645,807 B2) (*Tsuzumitani*, hereinafter). Applicants traverse these rejections for at least the reasons set forth below.

Applicants respectfully submit that independent claims 1 and 8, as well as newly added independent claims 68-71, and the claims dependent therefrom, are patently distinguishable over *Yamazaki*, *Kitazawa*, and *Tsuzumitani*, since *Yamazaki*, *Kitazawa*, and *Tsuzumitani*, either taken alone or in combination, fail to disclose, teach or suggest all of the features recited in the pending claims. For example, independent claim 1 recites:

1. A display device comprising:
an adhesion improving layer comprising one of a metal material and a metal oxide material over and in contact with one substrate of a pair of substrates;
a thin film transistor including:
a gate electrode comprising a conductive material over and in contact with the adhesion improving layer;
an island shape gate insulating film including at least one of a silicon nitride layer, a silicon oxynitride layer, and a silicon oxide layer, which is over the gate electrode;
a semiconductor layer over the island shape gate insulating film; and
source and drain wirings comprising a conductive material, which is connected to the semiconductor layer; and
a pixel electrode connected to the thin film transistor, wherein an end of the semiconductor layer is provided so as not to protrude from an end of the island shape gate insulating film.

Independent claim 8 (emphasis added) recites:

8. A display device comprising:
an adhesion improving layer comprising one of a metal material and a metal oxide material over and in contact with one substrate of a pair of substrates;
a thin film transistor including:
a gate electrode comprising a conductive material over and in contact with the adhesion improving layer;
an island shape gate insulating film including at least one of a silicon nitride layer, a silicon oxynitride layer, and a silicon oxide layer, which is over the gate electrode;
a semiconductor layer over the island shape gate insulating film; and

source and drain wirings comprising a conductive material, which is connected to the semiconductor layer; and

a pixel electrode connected to the thin film transistor, wherein an end of the semiconductor layer is provided so as to coincide with an end of the island shape gate insulating film.

Newly added independent claim 68 (emphasis added) recites:

68. A display device comprising:
an adhesion improving layer comprising one of a metal material and a metal oxide material over and in contact with one substrate of a pair of substrates;
a thin film transistor including:
a gate electrode comprising a conductive material over and in contact with the adhesion improving layer;
an island shape gate insulating film including at least one of a silicon nitride layer, a silicon oxynitride layer, and a silicon oxide layer, which is over the gate electrode;
a semiconductor layer over the island shape gate insulating film; and
source and drain wirings comprising a conductive material, which is connected to the semiconductor layer; and
a pixel electrode connected to the thin film transistor.

Newly added independent claim 69 (emphasis added) recites:

69. A display device comprising:
an adhesion improving layer formed of a metal material over and in contact with one substrate of a pair of substrates;
a thin film transistor including:
a gate electrode comprising a conductive material over and in contact with the adhesion improving layer;
an island shape gate insulating film including at least one of a silicon nitride layer, a silicon oxynitride layer, and a silicon oxide layer, which is over the gate electrode;
a semiconductor layer over the island shape gate insulating film; and
source and drain wirings comprising a conductive material, which is connected to the semiconductor layer; and
a pixel electrode connected to the thin film transistor, wherein an end of the semiconductor layer is provided so as not to protrude from an end of the island shape gate insulating film.

Newly added independent claim 70 (emphasis added) recites:

70. A display device comprising:
an adhesion improving layer formed of a metal material over and in contact with one substrate of a pair of substrates;
a thin film transistor including:
a gate electrode comprising a conductive material over and in contact with the adhesion improving layer;
an island shape gate insulating film including at least one of a silicon nitride layer, a silicon oxynitride layer, and a silicon oxide layer, which is over the gate electrode;
a semiconductor layer over the island shape gate insulating film; and
source and drain wirings comprising a conductive material, which is connected to the semiconductor layer; and
a pixel electrode connected to the thin film transistor,
wherein an end of the semiconductor layer is provided so as to coincide with an end of the island shape gate insulating film.

Newly added independent claim 71 (emphasis added) recites:

71. A display device comprising:
an adhesion improving layer formed of a metal material over and in contact with one substrate of a pair of substrates;
a thin film transistor including:
a gate electrode comprising a conductive material over and in contact with the adhesion improving layer;
an island shape gate insulating film including at least one of a silicon nitride layer, a silicon oxynitride layer, and a silicon oxide layer, which is over the gate electrode;
a semiconductor layer over the island shape gate insulating film; and
source and drain wirings comprising a conductive material, which is connected to the semiconductor layer; and
a pixel electrode connected to the thin film transistor.

Thus, independent claims 1 and 8, as well as newly added independent claim 68, are directed to, *inter alia*, the features of an adhesion improving layer comprising one of a metal material and a metal oxide material over and in contact with one substrate of pair of substrates, and a gate electrode comprising a conductive material over and in contact with the adhesion improving layer. Newly added independent claims 69-71 are directed to, *inter alia*, the features of an adhesion improving layer formed of a metal material over and in contact with one substrate of pair of substrates, and a gate electrode comprising a conductive material over and in contact with the adhesion improving layer.

Applicants contend that neither *Yamazaki*, *Kitazawa*, nor *Tsuzumitani*, either taken alone or in combination, disclose, teach, or suggest at least the features of an adhesion improving layer comprising one of a metal material and a metal oxide material over and in contact with one substrate of pair of substrates, and a gate electrode comprising a conductive material over and in contact with the adhesion improving layer, as recited in independent claims 1, 8, and 68. In addition, Applicants respectfully assert that neither *Yamazaki*, *Kitazawa*, nor *Tsuzumitani*, either taken alone or in combination, disclose, teach, or suggest at least the features of an adhesion improving layer formed of a metal material over and in contact with one substrate of pair of substrates, and a gate electrode comprising a conductive material over and in contact with the adhesion improving layer, as recited in independent claims 69-71.

Yamazaki appears to disclose a manufacturing method for forming polysilicon TFTs and amorphous silicon TFTs on the same substrate (see *Yamazaki*, e.g., paragraph [0127]). More specifically, *Yamazaki* appears to disclose forming a gate electrode 1002 on a substrate 1001, the gate electrode 1002 being formed in a desired shape using a photolithographic technique (see *Yamazaki*, e.g., paragraph [0129] and FIG. 1A). *Yamazaki* also appears to disclose that it is preferable to use a metal for the gate electrode 1002 that can be subjected to anodic oxidation to form an oxide layer 1003 on the gate electrode (see *Yamazaki*, e.g., paragraph [0129] and FIG. 1A). Next, *Yamazaki* appears to disclose forming a gate insulating film 1004 over the gate electrode 1002 and the oxide film 1003 (see *Yamazaki*, e.g., paragraph [0134] and FIG. 1A). Then, *Yamazaki* appears to disclose polysilicon active layer 1010 and amorphous active layer 1011 formed over the gate insulating film 1004 (see *Yamazaki*, e.g., paragraph [0137] and FIG. 1A). In addition, *Yamazaki* appears to disclose forming an etching stopper 1020 (see *Yamazaki*, e.g., paragraph [0139] and FIG. 1A). *Yamazaki* then appears to disclose forming a source region 1030, a drain region 1031, a source electrode 1040, and a drain electrode 1041 (see *Yamazaki*, e.g., paragraph [0141] and FIG. 1A).

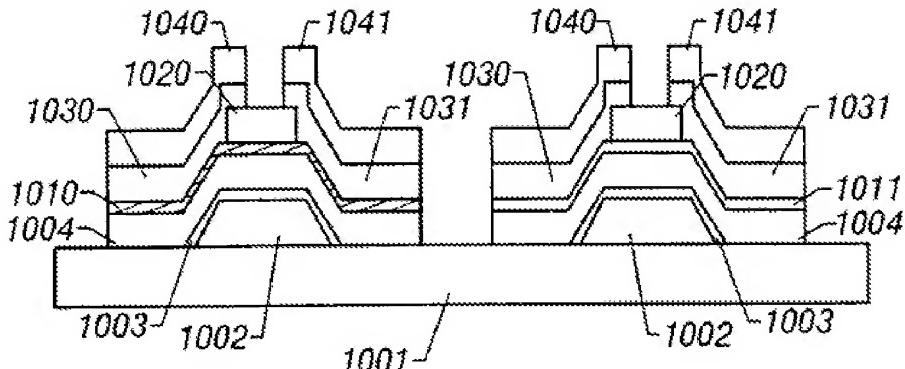


FIG. 1A

First and foremost, *Yamazaki* is completely silent with regard to an adhesion improving layer in contact with the substrate 1001, as in the present invention. Furthermore, as seen above in FIG. 1A of *Yamazaki*, the gate electrode 1002 is formed directly on the substrate 1001 and in direct contact with the oxide layer 1003. Thus, *Yamazaki* cannot disclose that the gate electrode 1003 is formed in contact with an adhesion improving layer.

Consequently, *Yamazaki* fails to disclose, teach, or suggest at least the features of an adhesion improving layer comprising one of a metal material and a metal oxide material over and in contact with one substrate of pair of substrates, and a gate electrode comprising a conductive material over and in contact with the adhesion improving layer, as recited in independent claims 1, 8, and 68. Additionally, *Yamazaki* fails to disclose, teach, or suggest at least the features of an adhesion improving layer formed of a metal material over and in contact with one substrate of pair of substrates, and a gate electrode comprising a conductive material over and in contact with the adhesion improving layer, as recited in independent claims 69-71.

In addition, Applicants respectfully assert that neither *Kitazawa* nor *Tsuzumitani* make up for the above recited deficiencies of *Yamazaki*. Consequently, the Examiner has failed to provide a proper *prima facie* case of obviousness in the rejection of independent claims 1 and 8. Accordingly, Applicants respectfully request the withdrawal of the rejection under 35 U.S.C. § 103(a), and the allowance of independent claims 1 and 8.

Further, claims 3-7 and 10-14 are allowable at least by virtue of their dependency from one of the independent claims, but also because they are distinguishable over the prior

art. Accordingly, Applicants respectfully request the withdrawal of the rejection, and the allowance of these claims.

Applicants contend that newly added claims 68-97 are distinguishable over the prior art. Accordingly, Applicants respectfully submit that newly added claims 68-97 are in condition for allowance, and such action is hereby solicited.

In view of the foregoing, it is submitted that the present application is in condition for allowance and a notice to that effect is respectfully requested. If, however, the Examiner deems that any issue remains after considering this response, the Examiner is invited to contact the undersigned attorney/agent to expedite the prosecution and engage in a joint effort to work out a mutually satisfactory solution.

Except for issue fees payable under 37 C.F.R. § 1.18, the Commissioner is hereby authorized by this paper to charge any additional fees during the entire pendency of this application including fees due under 37 C.F.R. §§ 1.16 and 1.17 which may be required, including any required extension of time fees, or credit any overpayment to Deposit Account No. 19-2380. This paragraph is intended to be a **CONSTRUCTIVE PETITION FOR EXTENSION OF TIME** in accordance with 37 C.F.R. § 1.136(a)(3).

Respectfully submitted,
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